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New Lauxaniid and Clusiid Flies (Diptera) Captured by Bait-traps[1]

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Abstract Two new species, *Minettia* (*Minettiella*) *japonica* SASAKAWA (Lauxaniidae) and *Sobarocephala mitsuii* SASAKAWA (Clusiidae), captured by bait-traps, are described. Habitats of both species, and relationship between two kinds of baits and the species attracted or sex ratios of flies are discussed.

Key words: Lauxaniidae; Clusiidae; Diptera; new species; Japan; bait-trap.

Only two species of the lauxaniid genus *Minettia* (*Minettiella*) have been known to occur in the Oriental Region (DE MEIJERE, 1910, 1924). Forty-six species of the clusiid genus *Sobarocephala* in the Nearctic and Neotropical Regions (SOÓS, 1962–65; SABROSKY and STEYSKAL, 1974), and two species in the Oriental Region (SASAKAWA, 1979, 1993) have been recorded. Recently, two interesting species of the genera *Minettia* (*Minettiella*) and *Sobarocephala* were collected in the bait-traps placed on the hillside in Saitama Prefecture, Japan, by MITSUI. The occurrence of these flies in Japan is, therefore, the first record in the Palaearctic Region, and they are described as new to science by SASAKAWA. Also, some ecological notes are given by MITSUI on the basis of data of collections.

The holotypes are deposited in the collection of the Entomological Laboratory, Kyoto Prefectural University(KPU), Shimogamo, Kyoto.

1. Descriptions of two new species

1. Minettia (*Minettiella*) *japonica* SASAKAWA, n. sp.

(Figs. 1–3)

Male & female. Black; frons pale brown (rarely testaceous) on ventral 1/5, shining but very sparsely grayish tomentose; face, parafacialia and gena gray-whitish pollinose; antenna pale brown, 3rd segment paler at base, arista black

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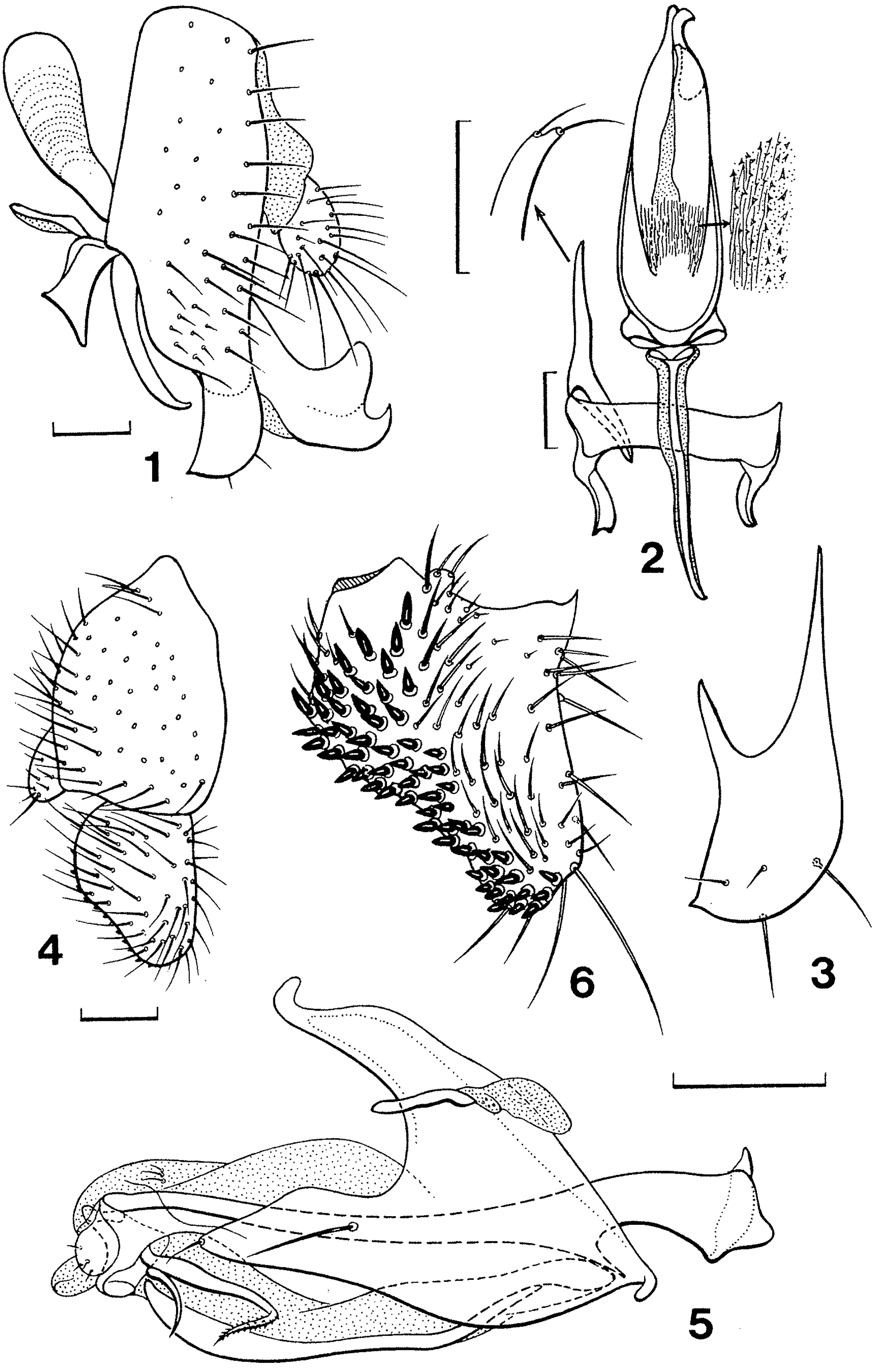

Figs. 1–6. Male genitalia of *Minettia* (*Minettiella*) *japonica* SASAKAWA, n. sp. (1–3) and *Sobarocephala mitsuii* SASAKAWA, n. sp. (4–6). 1 & 4, epandrium and surstylus, lateral view; 2 & 5, hypandrium, aedeagus and aedeagal apodeme (2: ventral, 5: lateral view); 3 & 6, surstylus, inner view.

except for pale base; palpus black; thorax sparsely brownish tomentose, mesonotum subshining; abdomen brilliantly shining. Wing hyaline, tinged with brownish yellow; halter yellow; legs black but bases of all tibiae, and mid and hind tarsi yellow.

Frons slightly wider than long, about 1.5 times as wide as eye, almost parallel-sided; parafrontalia very broad, each 1/3 width of frons at middle and more broadened at level of lower *or* which is about 2/3 length of the upper; *oc* slightly shorter than upper *or*; hairs present sparsely on ventral protrudent area of orbit; face flat; gena about 1/6 height of eye; 3rd antennal segment twice as long as wide, narrowing apically; arista short-haired, with longest hair 2/5 as long as width of 3rd segment. Mesonotum with 0+2 *dc*, anterior *dc* 2/3 length of the posterior; *acr* in 4 irregular rows, posteriormost pair distinctly long but slightly shorter than *prsc*; *ia* about 1/3 length of posterior *dc*; *ms* and *st* each one. Wing with r-m at middle of discal cell; ultimate section of M_{1+2} 1.7–2.0 times length of penultimate. Mid tibia with 1 spur; hind tibial *pd* shortest.

Male S6 as long as S5 but slightly narrower than that, with posterior margin very shallowly emarginated; protandrium annular but sternite horizontal in caudal view, about 2/6 length of T6 in dorsal side, without dorsal apodeme, sternite weakly sclerotized and with a seta on each lateral end; surstylus variable in shape, spatulate and minutely pointed on anteroventral corner, or gradually narrowed ventrally and pointed on tip; hypandrium U-shaped, but dorsolateral apodeme very short; praegonite long, with 2 setae near apex; aedeagus with lateral sclerites each pointed dorsally on apex but fused with dorsal sclerite before apices and formed a lobate dorsal process, spinulose and brownish-striated on median ventral membrane; aedeagal apodeme about 3/4 length of aedeagus.

Length of body 3.7–4.1 mm (♂, ♀; 4.1 mm in holotype), of wing 3.3 mm (3.1–3.6 mm in ♂, 3.5 in ♀; 3.5 mm in holotype).

Holotype male, Mikajima, Tokorozawa City, Saitama Pref., 1. VIII, 1994, in bait-trap, H. MITSUI (KPU No. 274). Paratypes: 7♂, 1♀, same data as holotype.

Distribution. Japan.

Remarks. This species is very colsely related to *M.* (*M.*) *atrata* (DE MEIJERE, 1910), known from Java, in general appearance, but is distinguishable by having the sparse rows of acrostichals. The shape of aedeagus is distinctive.

2. *Sobarocephala mitsuii* SASAKAWA, n. sp.

(Figs. 4–6)

Male & female. Chiefly yellow; frons shining, somewhat testaceous except for ventral 1/3; ocellar triangle and arista brownish black; gena, parafacialia, 1st and basal part of 2nd segments of antenna whitish; mesonotum and scutellum testaceous yellow, the former shining, usually with a pair of pale brown narrow vittae along *dc*-lines behind transverse suture in female; supra-alar area brown (between base of *sa* and wing base, extending posteriorly to base of outer *pa*); pleura whitish yellow, but notopleuron dark brown, extending dorsally just above level of *prs*-base; pleurotergite brown; postnotum narrowly pale brown along median line; scutellum sparsely pruinose, with a broad and dark brown median stripe, but variable in length: in female usually extending throughout its whole length and moreover anteriorly to bases of *prsc* beyond scutoscutellar suture, or separated narrowly by its yellow anterior margin from suture; in male stripe incomplete, or only spotted between bases of apical *sc*; abdominal tergites testaceous yellow, T1–2 each with pale brown median fascia, T3–5 each with broad median one (broadest on T4, only on anterior 1/2–3/4 on T5, and in female T6 brown posteromesally and T7 brown anteromesally; epandrium testaceous, brown on dorsal 1/2, with surstylus yellow; cercus whitish; ovipositor yellow. Wing distinctly fuscous along anterior margin of apical 3/5; calypter with margin and fringe brown. Legs yellow; coxae and basal parts of femora whitish, tibiae testaceous, fore tarsus brown. Bristles and setae dark brown to blackish.

Frons slightly longer than wide, slightly wider than eye (rarely 1.5 times width of eye), diverging ventrally; *or* 3, long; *oc* about 1/2 of 1st *ors* or subequal to *pvt*; parafacialia narrow, projecting linearly beyond eye margin in profile; gena 1/6–1/7 height of eye; *vi* long (only a little shorter than arista); *pm* 4 (–5); arista loosely plumose, subequal to height of eye in length.

Mesonotum with 2 postsutural *dc*, sometimes accompanying by a seta, which is almost 1/3 length of posterior *dc*, just before anterior *dc* (distance between additional setae and anterior *dc* about 1/4 that between anterior and posterior *dc*); acr in 8(–9) rows before level of anterior *dc* but in sparse 6(–7) rows behind that; *prs* weak, about 1/2 length of *h*; *prsc* approximately 1/3 length of posterior *dc*; outer *pa* longest among bristles, inner *pa* 1/3–1/4 of the outer; scutellum with 2 subapical setae which are nearly 1/3 length of apical *sc*. Wing with 2nd basal cell incomplete; r-m at or beyond middle of discal cell; ultimate section of M_{1+2} 3.5–4.2 (3.8–4.5 in ♂, 3.5–4.0 in ♀) times length of penultimate; mid tibial *pd* subequal to or 3/4 of inner spur in length; fore tibial *pd* 1/3–1/4 length of mid tibial one.

Epandrium as long as T7 in lateral side; surstylus narrowed ventrally, bearing many long setae on outer side, and 60–66 blackish spines and short setae on inner side; cercus 2/7 height of epandrium; hypandrium slightly longer than epandrium, with a long and a short setae; epiphallus short, 35 μm long; aedeagal apodeme 430 μm long; aedeagus 310 μm, largely membranous except for ventral rod-like sclerite, gonites 2 pairs, of which long one is minutely spinulose on apical part; ejaculatory apodeme 60 μm long, rod-like.

Length of body 2.9–3.4 mm in ♂, 3.4–3.7 mm in ♀; length of wing 2.3–2.8 mm in ♂, 3.1–3.3 mm (3.2 in holotype) in ♀.

Holotype female, Mikajima, Tokorozawa City, Saitama Pref., 9–19. VII. 1994, in bait trap, H. MITSUI (KPU No. 275). Paratypes: 2♂ 3♀, same data as holotype.

Distribution. Japan.

Remarks. In the color pattern of mesonotum and scutellum, chaetotaxy and the shape of surstylus, this species is similar to North American *S. latifrons* (LOEW, 1860), but the abdominal patterns are quite different from each other. Also, it is easily separable from Nepalese *nepalensis* SASAKAWA (1979) by the thoracic and abdominal patterns.

2. Collections of two new species

The lauxaniid larvae are saprophagous, living mostly under leaf litter and other plant debris, and the clusiid ones are found in the rotten logs or stumps of various trees. The lauxaniid flies occur in shady undergrowth and in dense vegetation by water, and the clusiids in forest. The female flies generally predominate in collections of both families by sweeping with a net. Also, it is stated that a good many females of the Nearctic *Sobarocephala*-species were collected by a Malaise trap, and also MCPHAIL fruit fly traps on the fruit trees, chiefly citrus (SABROSKY and STEYSKAL, 1974).

Periodical surveys with bait-traps were carried out once a month in Jan. 1990–Nov. 1992 (except for Jan. and Feb. 1992) by MITSUI, in Tokorozawa City, Saitama Prefecture, and Ohta District, Tokyo Metropolis. Moreover an additional collection of a certain fly was done in Jul.–Aug. 1994 in Tokorozawa City.

A handmade trap is a kind of fruit fly traps: 25 cm in length and 18 cm in diameter, cylindrical, and bonded with opaque (entrance side for flies) and semitransparent plastic vessels in each half side. It was baited with putrid flesh (about 30 g of minced pork, added 20 ml of 0.2% salicylic solution) or fermented banana (about 50 g, diced and yeasted), and was hung on a branch of tree at a height of 1.5–1.8 m above ground level.

Trap-sites captured the above mentioned new species, *Minettia* (*Minettiella*) *japonica* SASAKAWA and *Sobarocephala mitsuii* SASAK., were as follows (Tables 1 & 2): A–C, secondary deciduous forest reserve in the Tokorozawa campus, Waseda University; D, lowland marsh adjacent to the above mentioned forest; E, the side of athletic field bordered with trees artificially in the campus; F, secondary deciduous forest in Tamagawadai Park,Tokyo Metropolis; G, the

Table 1. Numbers of *Minettia* (*Minettiella*) *japonica* SASAKAWA captured by two kinds of bait-traps (one trap / trap site: A–F, see text).

Bait	Trap site	1990				1991							1992			
		June 7–21	July 5–19	Aug. 7–21	Sept. 7–21	Apr. 11–25	May 9–23	June 6–20	July 4–19	Aug. 8–21	Sept. 5–19	Oct. 3–17	June 6–21	July 6–21	Aug. 10–24	Sept. 7–21
Putrid pork	A	4♂	2♂1♀						5♂	1♂				1♂		1♂
	B	2♂	22♂1♀	2♂	2♂			1♂	2♂	1♂			1♂	8♂5♀	8♂1♀	
	C	1♂	12♂	1♀					1♂7♀	10♂9♀					4♂1♀	
	E					1♀										
	F	2♂								1♂			1♂			
Fermented banana	A											1♀				
	B														1♂2♀	
	C														1♂2♀	
	D										3♀					

Table 2. Numbers of *Sobarocephala mitsuii* SASAKAWA captured by traps baited with putrid pork (one trap / trap site).

Trap site	1990				1991			1992			
	June 7–21	July 5–19	Aug. 7–21	Sept. 7–21	June 6–20	July 4–19	Aug. 8–21	June 6–21	July 6–21	Aug. 10–24	Sept. 7–21
A		1♀	2♀			2♂3♀			21♂12♀		
B		1♂1♀							18♂12♀	1♀	
C		2♀	1♂			2♂			28♂11♀		
D						1♀					
E		1♀		1♀		2♀			1♂		1♀
G						1♂					

side of a high school ground bordered with trees artificially, Tokyo Metropolis.

As shown in Tables 1 and 2, only 4 males of *Minettia japonica* and 1 male of *Sobarocephala mitsuii* were captured in Ohta District, Tokyo Metropolis, during the whole period of investigation, while 128 (93 males and 35 females) and 126 (75 males and 51 females) flies, respectively, in Tokorozawa City. Especially, the great majority of these flies were captured by traps which were set in the forest (trap-sites A–C), Tokorozawa City, as compared with those in the open area: trap-sites D and E. On the basis of these results it is assumed that the breeding place of *M. japonica* is in the forest as well as those of the clusiid flies. Also, *M. japonica* were abundant in July and August, while *S. mitsuii* in July. Judging from the durations of developmental periods of the known Japanese lauxaniids, *Homoneura*-species, former species may pass over at least two generations during the summer (SASAKAWA and IKEUCHI, 1982). On the other hand, latter species may occur only once in summer.

Bait-traps with the fermented banana captured only 2 males and 8 females of *M. japonica* during the whole period of investigation, while there were 95 males among 122 specimens of the species collected in traps with the putrid pork. On the other hand, *S. mitsuii* were captured only by traps baited with putrid pork, in total of 126 flies. It is suggested that an influence of the collecting method by bait-trap on numbers of both sexes collected is apparently evident among the dipterous families.

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